Ergonomics in the Operating Room

Operating room staff are known to have several risk factors for musculoskeletal disorders including the following:¹

- Uncomfortable postures
- Prolonged standing
- Holding retraction for extended time
- Pulling/pushing equipment and/or patients during surgery.
- Prolonged fixed postures

These risk factors have led to a high rate of musculoskeletal disorders amongst surgeons and operating room staff, with reported discomfort due to operating room tasks ranging from 66 - 94% with pain typically occurring in the hands, arm, neck, low back and shoulders(Fig. 1).²

Figure 1. Possible areas of discomfort or injuries to O.R staff and surgeons - hands, arm, neck, low back and shoulders.
Ergonomics Needed in the Operating Room

Broadly defined, the goal of ergonomics is to prevent soft tissue injury and musculoskeletal disorders caused by exposure to force, repetitive motion, vibration and awkward posture. Practically, ergonomics is the concept of designing a working environment to fit the worker, rather than forcing the worker to fit the environment. While principles of ergonomics have been applied in various industries since the early 1900s, in the medical field, ergonomics applications didn’t gain interest until the early 1980s, with adoption of ergonomic principles continuing to be slow, even today. In the operating theatre in particular, one of the main ergonomic considerations is visual exposure of the surgical field. Exposure can be aided by proper positioning of the patient and the application of retractors to the wound and internal tissues.

Ergonomics Guidelines

In order to help with surgical ergonomics, the AORN in 2011 recommended the use of self-retaining retractors whenever possible. Further, several recommendations have been put forth in ergonomic guidelines for surgeons and OR staff including:

- The shoulder/upper arm should remain perpendicular to the floor
- The angle between the forearm and upper arm should be 90°
- The forearm should be held in a horizontal position, parallel to the floor and in a neutral position between supination and pronation
- Extreme wrist excursions should not occupy >30% of operating time
- Neck flexion should be about 20° and excessive head forward posture should be avoided as this can increase damage to the cervical spine
- Short breaks should be undertaken approximately every 20 minutes during a surgical procedure
Lack of Ergonomics Implementation

Despite surgeon and OR staff understanding of the importance of ergonomics within the operating room, there are several reasons for a lack of implementation of such solutions. Unlike other industries, standardization is difficult due to human anatomy, each patient’s surgery is unique, and different surgeons often use different surgical approaches and set-up for similar procedures.\textsuperscript{7}
The Walter Difference

The WalterLorenz™ Surgical Assist Arm is a bionic, electromechanical arm that enables surgical site optimization. The Walter Arm was created in collaboration with surgeons across multiple disciplines to assist with visual access, flexibility, and efficiency during surgical procedures. The Walter Arm is designed to retract tissues with steady pressure, alleviating the retraction burden and associated ergonomic/injury risks to the surgeon and operating room staff. By providing a stable platform, the Walter Arm may help to reduce fatigue and stress in operating room personnel, thereby reducing injury to surgical staff and improving overall surgical ergonomics to enhance operative efficiency and safety.
References


For more information on the WalterLorenz™ Surgical Assist Arm and Surgery Assisting Technology, please contact us at:

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